WHAT IS CLAIMED IS:

1. A substrate treatment process for removing organic matter existing on a substrate, which comprises the following consecutive steps:

treating said substrate with ozone water which has been prepared by dissolving an ozone-containing gas in ultrapure water; and

treating said substrate with hydrogen water which has been prepared by dissolving a hydrogen-containing gas in ultrapure water.

2. A substrate treatment process for removing organic matter existing on a substrate, which comprises the following step:

treating said substrate with ozone-hydrogen water, which has been prepared by dissolving an ozone-containing gas and a hydrogen-containing gas in ultrapure water, or with ozone-hydrogen water prepared by mixing ozone water, which was in turn prepared by dissolving an ozone-containing gas in ultrapure water, and hydrogen water which was in turn prepared by dissolving a hydrogen-containing gas in ultrapure water; or treating said substrate with said ozone water and said hydrogen water at the same time.

3. A substrate treatment process according to claim 1 or 2, wherein said substrate to be treated is a glass substrate or a substrate formed of crystals of silicon or a metal compound.

4. A substrate treatment process according to claim 1 or 2, wherein said substrate to be treated is a substrate contaminated with organic matter or ion-implanted organic matter.

5. A substrate treatment process according to claim 1 or 2, wherein said substrate to be treated is a substrate contaminated with organic matter adhered in a semiconductor element fabrication process.

6. A substrate treatment process according to claim 1 or 2, wherein said ozone water has an ozone concentration not lower than 10 ppm.

7. A substrate treatment process according to claim 1 or 2, wherein said hydrogen water has a hydrogen concentration not lower than 0.5 ppm.

8. A substrate treatment process according to claim 1 or 2, wherein said ozone water or said ozone-hydrogen water is applied to said substrate under treatment at a rate not lower than 1 mL/min per square centimeter of substrate area.

9. A substrate treatment process according to claim 1 or 2, wherein said hydrogen water or said ozone-hydrogen water is applied to said substrate under treatment after activating said hydrogen water or said ozone-hydrogen water by ultrasonic treatment.

10. A substrate treatment process according to claim 1 or 2, wherein said substrate is treated under rotation in a

horizontal plane.

11. A substrate treatment process according to claim 10, wherein said substrate is rotated at a rotational speed not lower than 500 rpm.

12. A substrate treatment process according to claim 1 or 2, wherein said substrate is treated in the same treatment apparatus.

13. A substrate treatment process according to claim 1 or 2, wherein said substrate is treated while being heated at a temperature not lower than 30℃.

14. A substrate treatment process according to claim 13, wherein said heating is performed while introducing heated ultrapure water or heated nitrogen.

15. A substrate treatment process according to claim 1 or 2, wherein said organic matter is subjected to ashing with an oxidizing gas before the step in which the substrate is treated with said ozone water, said hydrogen water or said ozone-hydrogen water.

16. A substrate treatment process according to claim 15, wherein said oxidizing gas is an ozone-containing gas; and said substrate is subjected to ashing at least once in a dry atmosphere while being heated at a temperature not lower than room temperature.

17. A substrate treatment process according to claim 16, wherein said substrate under ashing is heated at 300 to 350℃.

18. A substrate treatment process according to claim 17, wherein said ozone-containing gas has an ozone concentration not lower than 4 vol.%.

19. A substrate treatment process according to claim 1 or 2, wherein said substrate is cleaned with an organic solvent before the step in which the substrate is treated with said ozone water, said hydrogen water or said ozone-hydrogen water.

20. A substrate treatment process according to claim 1 or 2, wherein said substrate is treated with HF-containing water after the step in which the substrate is treated with said ozone water, said hydrogen water or said ozone-hydrogen water.

21. A substrate treatment apparatus for a substrate, comprising:

a treatment vessel,

a substrate holder for rotating said substrate in a horizontal plane in said treatment vessel,

a nozzle unit arranged in an upper part of said treatment vessel such that a liquid is downwardly fed,

a feed line for feeding the liquid to said nozzle unit, and

a chamber enclosing therein said apparatus in its entirety;

wherein said nozzle unit is constructed in a form of a bar such that as viewed in plan, the liquid ejected from said nozzle unit reaches, with an area range having a length not

smaller than a diameter of said substrate and a width smaller than said diameter of said substrate, said substrate.

22. A substrate treatment apparatus according to claim 21, further comprising an ultrasonic wave generator arranged in said nozzle unit.

23. A substrate treatment apparatus according to claim 22, wherein said nozzle unit is provided with at least one flow channel for ozone water, at least one flow channel for hydrogen water or at least one flow channel for ozone-hydrogen water; and said flow channel is shielded from ultrasonic waves.